Sportsman Pilot







Sportsman Pilot



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ALL ARTICLES AND PICTURES BY JACK COX UNLESS OTHERWISE CREDITED.

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EDITOR/PUBLISHER J. B. "JACK" COX O ADVERTISING MANAGER GOLDA COX

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MAG CHECK

I don't know what some of you folks are doin' to enrage the weather gods so, but I sure wish you'd stop! We've really been getting it at fly-ins for the past year, haven't we? A flood at Oshkosh, cold and rain at Reno last fall, ditto the Cactus Fly-In in February and still more at Sun 'N Fun in March. In fact, the only recent event we've attended that's escaped the wrath of Mother Nature was the EAA fly-in at Eloy, Arizona last October. You guys must have been living right.

But you know what? — we've had fun at every one of them. We go to fly-ins to see our friends, meet new ones and to drool over the airplanes . . . and a little stinko weather is not going to put a damper on that. We see others manifesting the same attitude — like the intrepid EAAer we spotted one day at Sun 'N Fun. Determined to ogle those showplanes come hell or high water, he had taken off his shoes and was striding manfully onward through the muck and mire . . . in his stocking feet!

Like the commercial says, you only go around once.

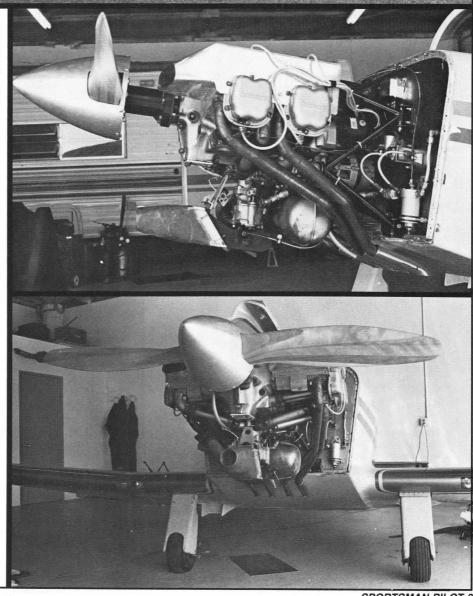


AN EVEN FASTER KR-2?

In our last issue, we ran an article on a very fast KR-2, Lance Neibauer's "Sweet Mildred". Well, we may have come across an even faster one. Wes Evans of Ventura, CA has been flying one of the "Cadillacs" of the KR fleet for the past couple of years with full upholstery, super finish, full house Revmaster 2100 Turbo, etc. So fancy, in fact, it came out weighing 760 pounds empty. To get the wing loading down, Wes added 2 feet and a drooped tip to each of his wings. This gave him 5 or so more mph in cruise, 100 fpm more climb and doubled his glide ratio! Using a Warnke Almost Constant Speed prop 53" long and with a radical 56" pitch, he was truing out at 180 mph . . . but the rate of climb was a modest 500 to 600 fpm and fully loaded, the CG was near the aft end of the envelope.

Studying the problem, Wes decided he needed 1) more power and 2) a little more weight in the nose. He accomplished both by installing a Continental 0-200. Despite the fact that the 0-200 has a starter, alternator, etc., the total weight, firewall forward, is only 8 pounds more than the Turbo Revmaster! The weight helps the CG situation and with a 60"x68" prop, the rate of climb is nearly doubled . . . so mission accomplished. A few changes had to be made to accommodate the 0-200: the landing gear legs were made 4 inches longer to provide adequate prop clearance and, of course, a new cowl had to be fabricated. The engine installation looks like something you'd see at Reno on a Formula One racer - and that's not as farfetched as it might appear. Ralph Wise, owner and pilot of No. 7 "Wise Owl", advised Wes on the installation. The cylinders are almost fully enclosed in inlet ducts so that all the cooling air goes down through the cylinders as it is supposed to.

The pictures you see here were taken the weekend of the first flights with the 0-200 . .



SPORTSMAN PILOT 3

. before the new cowl had been painted. All went well and Wes came back with a big smile on his face. There were no problems so he flew a total of 3 hours before he finally packed it in for the day. Hopefully, we'll see the airplane again this season and by then we're sure Wes will have some numbers for us.

Who knows, maybe he and Lance will have tangled by that time!

VELIE PRINTS

Noted antiquer, Morton Lester of Martinsville, VA, is looking for a complete set of drawings for the Velie engine . . . or any part of a set he could buy or at least copy. If you can help, contact Morton at 703/638-8783.

BUYING POWER

Don't want to speak ill of my fellow aviation scribes who write for other publications, but too many of them who ought to know better continually make amazed references in their articles to the good ol' days when a Monocoupe cost "only \$4800" or a Staggerwing "just \$18,870" or whatever. Given the inflation the world's currencies have suffered over the past 50 years, such figures are misleading to the point of absurdity. The only way to put them in proper perspective is to look at them in terms of buying power of the dollar - today's dollar compared with the dollar of the 1930s. The generally accepted rule of thumb is to multiply a 1930s dollar amount by 12 to get a rough idea of what it would mean in 1983 dollars. Thus, that "bargain basement" Monocoupe's \$4800 price tag translates into 57,600 of today's hard earned bucks . . . and that \$18,870 Staggerwing would cost you a cool \$226,440 today! I hate to shatter anyone's illusions, but airplanes have NEVER been cheap.

Perhaps things will come even more into focus when I tell you that as late as 1934, U.S. steelworkers had an average **annual** wage of \$422.87 . . . or \$5,073.84 in today's dollars.

DAVIS DA-2A, B RIGHTS

The exclusive design rights, master plans, form blocks and templates for the Davis DA-2A and B are for sale. Make offers to Mrs. Dorothy Moore, 231 Washington St., South Attleboro, MA 02703, phone 617/761-8189. This is, of course, the little two-place, side-by-side, low wing, V-tailed, all metal homebuilt designed in the 1960s by Leeon Davis — not the antique Davis from the late 1920s.

NEW KR-2 PLANS/NEWSLETTER

Lance Neibauer, whose beautiful KR-2 "Sweet Mildred" was featured in our last issue, has drawn up a new, much more detailed set of KR-2 plans for Jeannette Rand, owner of Rand Robinson Engineering. In a 3-ring binder format, the plans have gone from 55 pages to 125, from 24 drawings to 97 — plus many additional photographs. As you might suspect, many of the latter are of "Sweet Mildred". The new plans are \$95.00 and are available from Rand Robinson Engineering, 5842 K McFadden Ave., Huntington Beach, CA 92649. Phone 714/898-

3811.

The KR Newsletter has a new owner/publisher, John Forrester of Forrester Aviation Supply and Technology. John says the newsletter will continue to be a source of communication between builders and will include construction tips, flight test reports and much more. A 1 year (12 issues) subscription costs \$12 (USA), \$15 (Canada) and \$20 (overseas). Mail your checks to KR Newsletter, P.O. Box 4113, Englewood, CO 80155.

HALBERSTADT TREASURE TROVE

Ken Hyde and Stan Parris have pulled off one of the greatest coups in the annals of antique airplane collecting. After ten years of negotiations, they have purchased a barn full of World War I German Halberstadts, a mountain of spares and seven Mercedes engines! There are at least 3 complete CL.IVs in the lot, factory parts, extra wings, rolls of hex fabric and much, much more. The goodies were purchased in West Germany from a surviving World War I pilot, Herr Strähle, who had it all stashed high and dry in lofts. Some of the stuff is for sale — for details contact Ken Hyde, RD 1, Warrenton, VA 22186, phone 703/347-1909.

And speaking of Halberstadts, Carl Swanson of Rt. 1, Box 37, Darien, WI 53114, who cranks out a flyable full scale replica of a World War I type every year or so, is nearing completion of a Halberstadt D.IV, powered with a Spanish Tigre engine, an inverted, inline 4 turned upright to simulate a Mercedes. Carl also has a Sopwith Triplane underway for Doug Champlin's Fighter Museum in Mesa, AZ.

MILES AND ATWOOD SPECIAL REPLICA

His D.H. 88 Comet racer replica temporarily (hopefully) on hold while he seeks a sponsor, Bill Turner has contracted with Leon Atwood to build a full scale, flyable replica of the 1933 Miles and Atwood Special, winner of the Greve Trophy in 1934. Atwood purchased two Menasco C4S engines in Montana years ago (they were being used on snow sleds) and Bill has been overhauling them under the supervision of Ed Marquart. The racer will be built in Bill's hangar on FlaBob Airport at Rubidoux, CA. It will be flown on the fly-in/air show circuit for a couple of years, after which it will be placed in a museum to honor the memory of pilot Lee Miles, who lost his life in the original racer in 1937.

To build the Miles and Atwood special and other racer replicas, Bill Turner has formed a company he calls REPEAT Aviation — for Reproductions of Exotic Planes, Engines and Airframes by Turner.

Anyone wanting a flyable golden age racer replica built can contact Bill Turner, P.O. Box 3427, Riverside, CA 92509, phone 213/683-9582 (days), 213/784-0878 (evenings).

NEW FORMULA ONE

All we are at liberty to tell you about this next item is that Molt Taylor has been contracted to design a new Formula One racer for an established air race team. Molt will utilize the latest materials and prop technology to try to best the Shoestring clones that have dominated Formula One racing for so long.

FOREIGN NEWS

Due largely to ruinous levels of taxation and very high fuel costs, most European sport pilots belong to aero clubs, typically flying Cessnas, Pipers and French Robins. In the last couple of years, the worldwide economic mess has driven even club rental rates out of the reach of the average European working man. In an attempt to alleviate the situation, France's Federation Nationale Aeronautique (equivalent of the NAA in the U.S.) has conducted a contest which had as its goal the design of an aircraft which would halve the operating cost of conventional twoseaters - 150s, Tomahawks, etc. The winner was the French company Avions Robin . . . yes, the outfit that started out 20 years ago building the all-wood Jodel.

Robin's design is a two-place, side-by-side low winger with a V-tail. The fuselage is made, sailplane fashion, of molded shells of Kevlar and carbon fiber/epoxy laminate. Interestingly, the wing and tail surfaces are made of wood and covered with Dacron. Robin believes a wooden wing is lighter, easier to build and repair than one of composites. Span will be 33 feet and the empty weight will be 440 pounds.

The aircraft, called an ATL (Avion tres leger), will be powered by a new two-cycle, three cylinder radial developed by the JPX/Buchoux company with Robin funds. There will be two versions, one producing 47 hp and a second cranking out 60 hp. Cruise of the ATL with 47 hp will be 90 knots, 97 with 60 hp.

The French government is supporting the effort in the form of developmental loans and use of its aeronautical test facilities.

Another intriguing Robin project is the development of a V-6 automobile engine for use in one of their **certified** aircraft. It's the PRV engine used by Renault, Volvo, Talbot and the controversial DeLorean. It will be fitted with a belt reduction unit and Robin is said to be attempting to get the French airworthiness authorities to permit single ignition so that as few changes as possible will have to be made to the engine. Around 160 horsepower is expected . . . at much less cost than a Lycoming or Continental.

What happens if all these government backed programs are successful? Is the U.S. lightplane industry being set up . . . just like the U.S. auto industry was a decade ago? Have Piper, Beech and Cessna learned anything from the trouncing GM, Ford and Chrysler have taken since 1975 or so . . . or do they have any real interest in the two seat market?

Q200

"Q200" is the designation for the new Continental 0-200 powered Q2. It has a new canard that contains a tapered, tubular spar made by winding carbon fiber onto a mandrel — just like deep sea fishing rods are made. Afterwards, it is placed in an autoclave for cure. The result is a light and extremely strong spar that permits the use of an airfoil 3% thinner than the old Q2 GU section. This canard with its tubular spar is considered mandatory if an 0-200 is used in the Q2 airframe. Both are retrofittable to existing Q2s.

The Q200 is FAST . . . but at this writing,

the optimum prop has not yet been tested, so the numbers you want to hear will have to wait.

THE CACTUS FLY-IN

The 1983 Cactus Fly-In was the 25th Anniversary edition of the Arizona Antique Aircraft Association's annual mid-winter event. Held at Marana in the early years, it was later moved to Casa Grande and for the past two years has been held at the big Litchfield Municipal Airport, just west of Phoenix. It always draws a lot of California airplanes and, when weather permits, antiques from as far east as Texas and Oklahoma.

This year the weather was a problem. One of the seemingly endless succession of fronts that ravaged the California coast throughout the winter had just passed through Phoenix and spent the weekend battering New Mexico and West Texas . . . and blocking everyone attempting to fly in from the east. It was a huge storm area and, unfortunately, the backwash remained in central Arizona all weekend, keeping cool temperatures and cloudy skies over the Valley of the Sun. A lot of California airplanes got in, including the two trophy winners presented in this issue, but attendance was definitely hurt this year.

The local AAA folks had done their best, however, and for those of us who were there, it was a fun weekend. A barbecue rib dinner was staged on Friday evening at the airport restaurant and an awards banquet was held on Saturday night at the Officer's Club at nearby Luke AFB. A highlight was the performance of the Over The Hill Gang, a 15 piece group that specializes in the big band music of the late '30s and '40s . . . most appropriate for an antique airplane fly-in.

The major award winners were:

Best Open Cockpit Biplane - The Newhouse Clan of Chicago and Tucson for their Bird CK, NC914V.

Best Antique Cabin Monoplane - Mel Heflinger of Torrance, CA for his Harlow PJC-2, N18978.

Best Classic Cabin Monoplane - Chester M. Rettig of Tempe, AZ for his Piper J-3, N35487

Best WWII Trainer - Mike Walton of Scottsdale, AZ for his Stearman, N4813V.

Best Warbird - Arizona Wing of the CAF for its B-17.

Best Neoclassic (Postwar) - Bert Kanowitz of Phoenix, AZ for his Forney Ercoupe, N7564C.

Best Homebuilt - Ken Brock of Anaheim, CA for his T-18, N42KB.

Best of Show - Brad Larson of Santa Paula, CA for his Ryan SCW, NC18912. Congratulations to all.

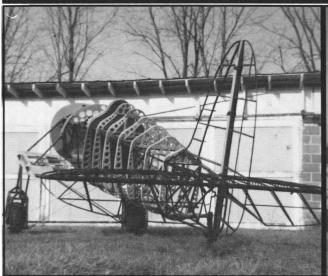
OF HELIOS AND BUTTERCUPS

The Helio Courier is like the proverbial bad penny, it just keeps turning up. After being out of production for 71/2 years, Helios are again being made in the small Kansas town of Pittsburg. Two versions are being produced: the Model 700 with a 350 hp turbocharged engine and the 800 with a 400 hp normally aspirated engine. The airframes are essentially the same as earlier models, with the exception of a new composite landing gear.











Travel Air Mystery Ship

Monocoupe 125

The newly organized company, Helio Aircraft Ltd., also has a low wing prototype flying. It utilizes the standard Helio wing with all its high lift devices.

Helio Couriers are hardly sportplanes, but we mention their revival because most pilots have a great deal of interest in an airplane with its low speed capability. Most of us value raw speed above all other virtues in airplanes but, paradoxically, our second most desired capability is a low landing (and take-off) speed . . . or short field capability or whatever you want to call it. We want our cake and we want to eat it, too . . . we want an airplane that will equal the Helio Courier on the low end, blow off a Bonanza's doors on the top end and, of course, do all this on 6 or 8 gallons per hour - right? What we want doesn't presently exist, and if it did would likely be too expensive for 99% of us.

There is a little airplane that has been around since the late 30s that was intended to similarly straddle the performance fence to the extent its modest power would permit and the worst thing you can say about it is that only one has ever been built. I'm talking about Steve Wittman's Buttercup. Here is a little 2-place, side-by-side high winger powered by a Continental C-85 that stalls a T-Craft right out of the sky on the low end, yet runs off and hides from a Luscombe 8E on the top end. It does this with a clever and mechanically simple variable camber wing. For take-off or landing, a flap lever is pulled which not only lowers the trailing edge flaps, but at the same time droops the leading edge. In cruise, the relatively short wing is cleaned up with one flip of the wrist - and off the little bird goes to a straight and level speed that's very respectable for a fixed geared, strutted wing airplane.

Steve has the Buttercup flying again and is keeping it at his winter home in Florida (on Jimmy Leeward's Skyranch near Ocala). Steve had been giving demo rides all winter and everyone who has had the privilege has come away amazed with Buttercup's wide range of performance. Each one recognizes that here is an airplane that can be operated on a modest budget, can be safely flown from very short strips (and, of course, could be force landed more safely than most other airplanes) and has a good cross country

capability.

A lot of us have encouraged Steve to draw up some plans for the Buttercup. With so many of us sportsman pilots moving out to private strips, there should be more demand for such an airplane today than ever before.

It's an airplane whose time has come . . . again.

ULTRALIGHTS AT SUN 'N FUN

The ultralights were a very big part of the annual Sun 'N Fun Fly-In again this year. As usual, there were a lot of new designs, however, none that dramatically advanced the state of the art. Almost everything has fixed seats and 3-axis controls these days, and enclosed cockpits (and even fuselages) are becoming more and more common. Predictably, there were a number of new variations on the Quicksilver theme, but there were even more blatant copies of others. It's a wonder the principals didn't square off in a mud fight (there was plenty available for ammunition!) or something equally semi-violent.

One significant trend was the wholesale shift to Rotax engines. Almost every major manufacturer has switched, although most planned to offer Cuyunas and Kawasaki's as options as long as the demand holds up. The switch to the Austrian-made Rotax is logical enough, given the short history of the ultralight movement: it has more power and is cheap. Several years ago we saw Cuyuna take the market in a similarly sweeping fashion, offering a roughly 10 horsepower increase over their competitors. Rotax is upping the ante another 10 to 15, so it appears they will be king of the hill for the immediate future . . . until someone comes along to top them. Sound familiar? More power is a temptation we Americans have never been able to resist.

MILITARY ROTECS

In a recent conversation with Bill Adaska, founder and president of ROTEC Engineering (Rally), it came to light that he has at least two military contracts for special versions of his Rally Sport (the aerobatic version). Changes requested included camoflage wings and tail, black tubing and a lot of

engine work to reduce noise, like a 4-blade prop, a coating on parts of the engine to cut down on the "tinny" sound and a carb filter to hush intake noise.

The countries involved are classified, as is the use they will make of the Rallys. Does make one wonder, doesn't it?

ROTEC, incidentally, joined Eipper in giving aerobatic demonstrations in the evening air shows at Sun 'N Fun. Bill and his demo pilots all have low-level aerobatic proficiency/ waiver cards issued by FAA — just like all air show pilots. The cards list the maneuvers the pilots can perform, each of which was demonstrated to an FAA inspector.

KINNER COUPE TO FLORIDA

In January, Willard and Donna Benedict were driving up I-75 just north of Ocala, FL when they spotted the unmistakable profile of a Monocoupe on a trailer — headed in the opposite direction. They turned around at the next cut off and chased the 'Coupe for 20 miles before catching up. It turned out to be the one and only Kinner powered Monocoupe (N797H) being delivered to its new owner, Grover Summers of Winter Haven, FL. Rodney Ratts of Adel, GA was hauling it south. This is the Kinner powered Monocoupe 125 restored in the mid-1960s by Evander Britt of Lumberton, NC. It was subsequently owned by John Shields and Dr. Gordon Morkel and, still later, by Nick's Aero Service in Lake Village, IN. Yellow and black, the 125 is a striking airplane and we hope to see it at Sun 'N Fun next year.

Willard and Donna also own a Monocoupe, a Lycoming powered beauty, and are well along with a replica of the Travel Air Mystery Ship — Frank Hawks' Texaco No. 13. Pictured here, you can see how much work goes into the fuselage before the plywood skin is put on. The Benedicts live at 129 Cedar St., Wayland, MI 49348.

NEW ULTRALIGHT AIRPLANES

Wayne Ison, designer of the PDQ, will unveil a new ultralight airplane sometime this year. It's a low wing, open cockpit job that utilizes the "basket weave" or so-called geodetic form of construction we wrote about last year in regard to Mike Fisher's FP-101. Mike, you may recall, used a drawing by Wayne to develop the FP-101...and, now, Wayne has decided to build one of his brainstorms, himself. Both Wayne and Mike worked with Gerry Ritz to learn his geodetic techniques. Gerry, incidentally, will introduce three new geodetic ultralight airplanes of his own this summer.

Each of these new designs are 3-axis, "real airplane" types that can be built as FAA Part 103 ultralights or be licensed as homebuilts.

Wayne Ison can be contacted at 933 Highland Dr., Manchester, TN 37355.

SUN 'N FUN '83

The "in" joke at Sun 'N Fun '83 was that this year's edition should have been tagged the "rain and pain" fly-in. Actually, mud was the real problem, a legacy from an entire winter's saturation of the state. EAAers struggled through, however, and had a successful week. It was the best year ever for homebuilts and, of course, the ultralights were all over the place — they even had a water-filled trench for floatplane operations.

The major award winners were as follows: **Grand Champion Homebuilt** — Osprey 2,

Dick Borremans, of Green Bay, WI. **Grand Champion Rotorcraft** — RotorWay

Exec, Home Bell of Waynesville, OH. **Grand Champion Replica** — Great Lakes,
Bob Wilson of Ocala, FL.

Grand Champion Ultralight — American Aerolight, Falcon.

Grand Champion Antique — Chuck Andreas, Bill Brennand and Byron Frederickson, Neenah, WI, Stinson SM-6000B.
Grand Champion Classic — Swift, Bill Copp of Lexington, MA.

Grand Champion Warbird — AT6, James Bennett of Chestertown, MD.











Owners of the handful of Harlow PJC-2s left today have two heavy crosses to bear:

"Say, this is a beautiful Spartan Executive!"
And the dreaded . . .

"Oh yeah, this is the plane that was named after that movie actress, Jean Harlow."

If they'll still talk to you after either of those all-too-frequent faux pas, you'll find they have an interesting story to tell. Theirs is among the rarest of antique aerial devices and is the only certificated airplane we are aware of that was designed in a **public** school. Then, to add an aura of mystery to the tale, there's the fact that Howard Hughes had an early connection with the airplane.

A LITTLE LORE

The name Harlow had nothing to do with slinky movie stars; it was simply the last name of the airplane's designer, Max D. Harlow, a professor of aeronautical engineering at California's Pasadena Junior College, which, in turn, is where the PJC model designation came from. The PJC-1 was a small tailed prototype that was unable to recover from a flat spin that occurred during aft CG testing . . . and CAA's ill advised requirement that the spin recovery be made with ailerons only. The PJC-2 was the same airframe with the 17% larger vertical tail you see pictured

here

The Harlow is historically significant in that it was the late 30s progenitor of the now common "high performance" general aviation airplane — a low wing, retractable geared, four place, all-metal design that depended on aerodynamic cleanliness rather than brute horsepower to achieve its good performance. The next decade's Bonanza would put the final nail in the coffin of the design philosophy that brought us the 450 horsepower Staggerwings, Spartan Executives, Howards, Waco SREs, etc. of the 1930s but with the benefit of 20/20 hindsight, we know today that Max Harlow had seen the light as far back as 1936.

The previous year he had joined the PJC staff and had immediately gone to work convincing the city school administrators (PJC was an early community college) that his new aeronautical engineering department should provide students with real world, on-the-job experience in aircraft design, much like the famed German technical institutes had been providing for generations. Aircraft design and construction was on the threshold of revolutionary change, he told them — from wood, tube and fabric to the new multicellular/ stressed aluminum alloy skin concept developed by Jack Northrop in 1930 and more recently employed in the spectacular new

DC-3. This sort of construction was the wave of the future, Harlow maintained, and most new designs, including lightplanes, would be built that way. It was imperative then that his students learn how to design with the new materials, stress analyze them, etc. if they were to go on to work in the aircraft industry. The best way to accomplish those goals, Max argued, was to design and actually build a totally new airplane in the PJC classrooms.

Harlow must have been a smooth talker, because he got his way. By the fall of 1936 the design of the airplane was complete and the students began cutting metal. 10 months later, test pilot Jack Kelly lifted the PJC-1 off the runway for the first time at the nearby Alhambra Airport.

After the crash of the PJC-1 and the subsequent development and certification of the PJC-2, in August of 1938, the Harlow Aircraft Company was incorporated (in 1939) and began building six airplanes for the CAA—for use by its inspectors. Nine airplanes were built before World War II dried up civilian aircraft production . . and there is some evidence to suggest that two more PJC-2s were put together from parts for use during World War II.

After the war, an effort was made to resume production with an improved design, the PJC-4 (later redesignated the Atlas H-

10). Bankers refused to cough up the needed cash, however, when they learned the new airplane would have a price tag of ten grand. "How do you expect to sell a four place airplane for that much," they asked, "when Republic is selling its Seabee for \$4995, North American its Navion for about \$5000 and Beech its Bonanza for less than \$9000?"

Max remained with the school, later renamed Pasadena City College, until his death in 1967. One of the first to earn an aeronautical engineering degree from Stanford University, he had a distinguished career even before coming to PJC, including engineering stints with early metal airplane pioneer, Herb Thaden; Bach Aircraft; various projects with Waldo Waterman, including the roadable Aerobile; Kinner; Northrop and Douglas. The latter two undoubtedly influenced Harlow's desire to build an all-metal lightplane, because the PJC-2 is very much a "little DC-3" in its construction method and materials. Max also had a hand in the design of the wings for the Hughes H-1 racer . . and was a Hughes consultant thereafter until his death. He was one of those who got phone calls any time day or night from the eccentric billionaire.

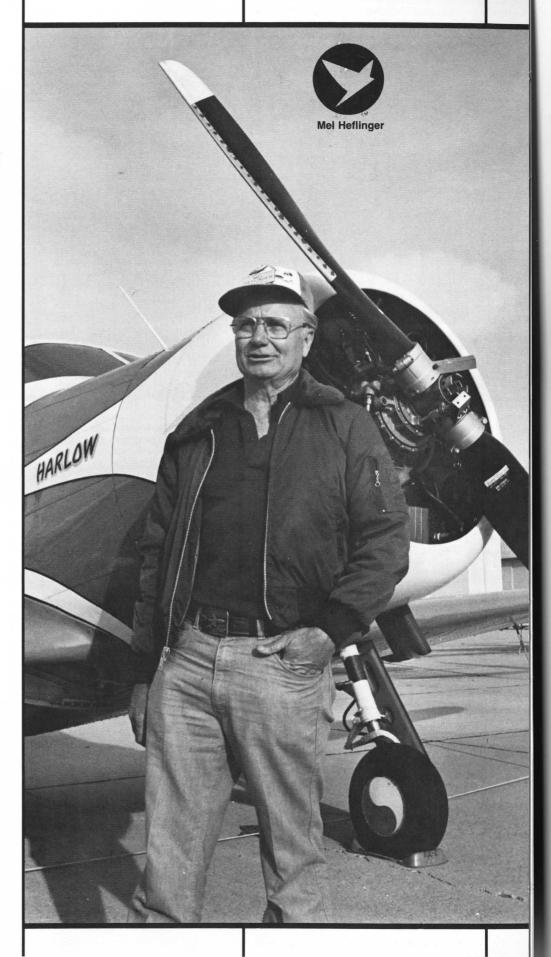
MEANWHILE, BACK IN 1936 . . .

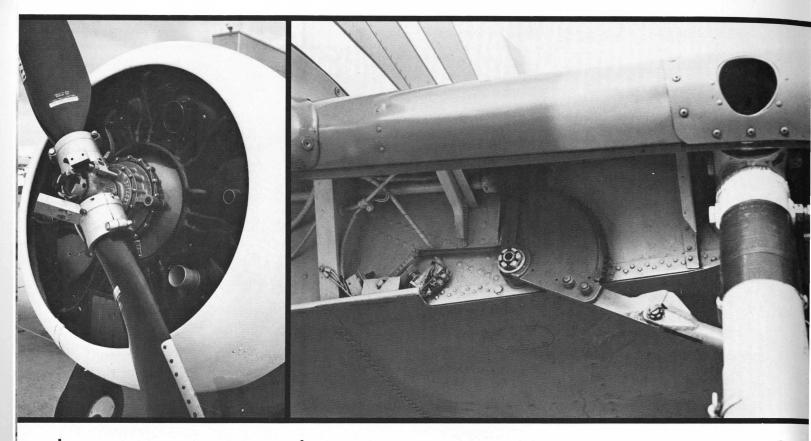
. . . An airplane crazed Pasadena teenager was riding his bike down to Alhambra at every opportunity to watch the prototype Harlow being built in PJC's Technology Lab . . and, later, out to the local airport to watch the test flights. Young Mel Heflinger was also a weekend tormentor of mechanics and airplane owners at the Burbank Airport, where he soon gained the dubious distinction of having been thrown out of more hangars than any other kid in greater LA! He channeled much of his enthusiasm into a more constructive stream when he became a PJC student . . . and when he began taking flying lessons in an E-2 Cub at the Alhambra Airport. Money was hard to come by in those days, however, and the lessons were few and far between. In 1939 his luck changed. With World War II eminent, the Civilian Pilot Training program was instituted, including a course at good ol' Pasadena Junior College. PJC had an original quota of 40 students and Mel was one of the first to apply. At 17, he was a year too young, but he tried, anyway . . . in fact, nagged the dean of the school so persistently that when the quota was not filled, he made an exception and enrolled Mel - probably just to get him out of his hair!

Before his 18th birthday, Mel had soloed . . . in the first Luscombe 50 on the West Coast . . . and earned his Private license. As soon as he was 18, he progressed to an instructor's rating and soon was teaching aerobatics in the Waco UPF-7 at a little airport in east LA.

After Pearl Harbor, Mel was selected as an aerobatic instructor at the famed Tex Rankin flight school at Tulare, CA and remained there until early 1944. When the school began phasing out, Mel, who had always wanted to be an airline pilot, drove down to Burbank and applied for a spot with United. He was hired and soon found himself flying co-pilot on DC-3s out of Chicago.

One night in Des Moines, his -3 was laid up with a bad mag and the overnight delay afforded him the opportunity to meet a win-





some young radio operator - Dot was her name - he would marry that December. December the 6th . . . because they didn't want to start another war on the 7th, they joke today.

A year later, Mel was reassigned to United's modification center at Cheyenne and spent a year - until war's end - testing DC-3s and B-17s, B-24s and other military jobs United was overhauling under government contract.

In 1945 the Heflingers moved on to San Francisco where Mel was assigned to a short lived program known as the Domestic Military Transport Service — another United government contract in which returning servicemen were being flown home.

Another year, another transfer — this time flying C-54s from Honolulu to newly occupied Japan. Finally, in 1948 Mel had climbed the seniority ladder far enough to slip over into the left seat. Made a DC-3 captain and based in Los Angeles, he settled down to a life of coping with and enjoying every minute of advancing aviation technology - to the Convair 340 in 1951, the Boeing 720 in 1960 . . but about here is where the Harlow comes back into the story.

A FUNNY THING HAPPENED ON THE WAY TO FLY THE HONEYBEE . . .

During a long layover in San Diego during the last months of the 340 phase of his career, Mel gave Bill Chana a call to take him up on a longstanding offer to fly the Honeybee. Later, driving into Montgomery Field, Mel suddenly exclaimed, "My gosh, there's a Harlow!"

"What's a Harlow?", Bill replied. Mel was half out of the car by this time, so Bill stopped to see what the commotion was all about. He wasn't impressed . . . the thing Mel was raving about was without question

the worst looking piece of junk on the airport. Hailing down a mechanic, they learned the Harlow had recently been ferried in from Texas . . . minus cowling and fairings, with the gear down and the wheel wells covered with fabric patches and an instrument panel devoid of a single instrument. A tach had been jury rigged on the firewall and could be read only by peering through one of the holes in the panel. An oil tank had been strapped in the right seat and two holes had been cut in the firewall for the hoses. The Aeromatic prop had partially delaminated on the flight west and it now sported an FAA red tag -"condemned" it said.

The owner had bought the airplane with the intention of having it restored. Apparently, the mechanics who took on the job seriously underbid it, however, because they ran out of money before they really got down to the serious aspects of restoration. Mel kept tabs on their progress as the months went by and when it was obvious work had ground to a halt, he gave the owner a call, offering to buy the Harlow. He had talked a couple of friends into a partnership and used that fact to assure the owner the ol' bird would be restored and would have a good home. Mel's pitch carried the day and in September of 1961, he had himself a Harlow.

The decrepit hulk had to be disassembled and trucked to the Torrance, CA airport . . . which has been its home ever since. Restoration work began immediately but it would be eight years before the airplane would fly again - on August 16, 1969. Along the way, Mel's two partners would move away from LA and, ultimately, he became the sole owner of the PJC-2.

The Harlow was an amazingly "modern" airplane for the mid-30s when it was designed, and even the late 30s when it finally went into production. It was built with what were then the very latest, state of the art materials, using the most advanced design techniques. It had an electrically actuated retractable gear, with "grasscutters", or lower gear doors, so that the bottom of the wing was perfectly smooth when the gear was up, and a perforated split flap, a la Douglas Dauntless, was also electrically driven.

Full dual controls, including toe brakes on both sides (Piper, Beech and Cessna, take note), dual trim tabs, hydraulic brakes and a tailwheel that automatically locked when the flaps were lowered 10° were standard features.

Inside, the cabin was roomy by today's standards, but likely was not considered exceptional back there in the era of the big 450 cabin jobs. Mel says that Max Harlow was a great admirer of the Oldsmobile and took the interior dimensions of his 1935 sedan as the standard for his new aircraft design.

The Harlows were certified with 145 hp Warner engines and most left the factory with either a fixed pitch wood prop or Curtiss-Reed metal prop. A 34 gallon fuel tank fitted into the wing - right under the front seat . . . which should have been more than ample reason to always remember to lower the gear! And, incidentally, in case the electric motor went on the blink, a little hand crank was provided to wind down the gear. As you can see in the pictures, the gear legs are raised and lowered by a transverse shaft with a little worm gear at each end. These rotate a gear sector that, in turn, actuates the gear legs. An electric motor, gigantic by today's standards, drove the transverse shaft. Two holes in the cabin floor allowed the pilot to the poke the crank down and make direct contact with the retraction mechanism. If the gear was free to move, the hole that meshed the crank and with a little gear that provided a 4.5 to 1 speed up was chosen. With it the gear could be lowered with 200 turns. If a little more mechanical advantage were

needed, the other hole was chosen. This meshed the crank with the worm on top of the motor shaft and required — are you ready for this — 900 turns!

Fortunately, the Harlow's retraction system was quite reliable. Mel has only had to use the emergency system twice . . . successfully, I'm pleased to report. It was a pain, though, and it prompted him to devise his own crank, utilizing a standard Yankee hand drill modified for the job. It gives better leverage and allows Mel to keep his head up while cranking.

Actually, there are a number of significant modifications to this particular airplane. Somewhere along the line, its original engine had been replaced with a larger Warner R-550-3 from a Sikorsky R-4 helicopter, mounting ring and all. Rated at 200 hp for take-off and 185 hp for cruise, it gave the Harlow a welcome boost in climb rate and in cruise. A Hartzell variable pitch propeller was installed and does wonders for the airplane. Mel would like to get a little more pitch travel in order to use the full 200 hp for take-off, but, otherwise, likes the prop. It's not a constant speed unit ("I'm the governor."), but it gets the job done.

As previously mentioned, Mel got the airplane minus engine cowling, fairings, electrical system and instrument panel. All had to be fabricated, essentially from scratch. The gear doors were particularly troublesome . . but ended up providing Mel with a new career.

The first thing he did after getting the airplane home was to rush over to visit Max Harlow to get confirmation on the Serial

Number — #1 it said on a makeshift plate some previous owner had installed. The N number had been changed as a result of the ol' bird's wartime service, so that was no help, but Max was able to search the old PJC records and come up with component serial numbers that confirmed that yes, indeed, this was the very first PJC-2. Over the next few years, Mel would consult Max on many occasions, one of which involved the lower gear doors. Those "grasscutters" were highly susceptible to damage on the largely unpaved airports of the late 30s, and rarely lasted more than a few months before owners discarded them. Mel wanted the aerodynamic cleanliness they provided, but didn't want their maintenance problems. He came up with the idea of modifying the wing root fairing so that the portion of it ahead of the wheel well would deflect most of the slipstream and ran it by Max.

"Sounds like a good idea," he said.

The fairing was made by first slapping a lot of modeling clay in the wing root/fuselage juncture and sculpting it to the desired shape. A plaster mold was pulled off this and it, in turn, was used to make the fiberglass fairing that went on the airplane.

After this exercise, Mel began playing around with the 50 pounds or so of clay he had left over and to his and everyone else's surprise, found he had a natural talent for sculpture. Now, we're not talking about making crude faces or Indian bowls, we're talking museum quality work . . . human torsos (Mel's partial to female nudes) . . . beautifully done busts, etc. He's had a number of things

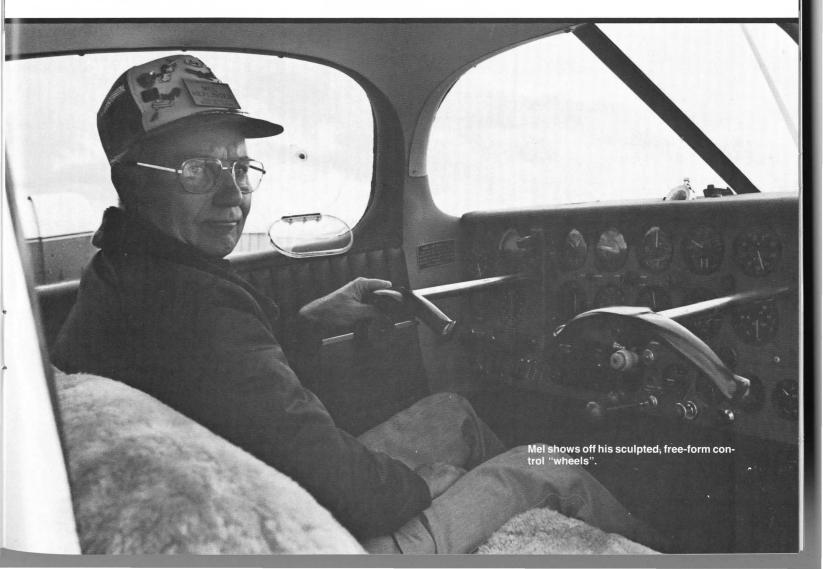
cast in bronze and has had them displayed.
Who says this ol' airplane fiddlin' doesn

Who says this ol' airplane fiddlin' doesn't have some redeeming cultural virtues?

Mel even used his newfound sculpting talent on the Harlow. He built a completely new instrument panel (using the Convair 340's as his ideal) — only to find his precise placement of instrumentation to be partially blocked by the big old original round control wheels. That wouldn't do, so he sculpted a free form shape that's a sort of cross between a boomerang and a conventional ram's horn "wheel" and cast it in aluminum. You can see it in the pictures.

Other changes included replacing the old fuse boxes with circuit breakers, his own selective tailwheel lock, a total circuit condition ammeter, a 19 gallon Navion wing tank under the rear seat to up total fuel capacity to 53 gallons and, more recently, Mel's pride and joy, an electric pump to run the oil that normally drains down into the lower cylinders when a radial is at rest back into the oil tank. He simply punches a timer switch after he shuts down the Warner and the pump runs for 15 minutes — the time he has determined it takes the oil to normally run down. Mel thinks every radial ought to have one to save bent rods, broken piston lands and all those other bad things that result from trying to start an engine with a cylinder or two full of oil.

The Harlow's airframe was found to be in amazingly good shape as far as corrosion was concerned. A wing tip had to be replaced and a few spots here and there had to be cleaned up, but, otherwise, it was pretty clean. The years and the elements had taken



their toll on the alclad, however, and although new Harlows were delivered from the factory essentially in bare metal, Mel chose to paint his. It just wouldn't have polished out to look like the ones he saw in the late 30s at Alhambra.

A DETECTIVE STORY

Like any antiquer worth his salt, Mel spent as much time during the 8 year restoration period searching out the history of the airplane as he did working on it. As a teenager, he had witnessed the test flight of the airplane that one day would be his own, but had lost track of it afterwards. He got no log books with the airplane and FAA records were of little help, but through conversations with Max Harlow and others, he eventually began to piece together the life and times of ol' 18978.

He learned, for instance, that the airplane had remained at the factory for a time, completing the certification flight testing and serving as a demonstrator. Jimmy Doolittle was one of the pilots who flew it during this period and Howard Hughes had access to the airplane. Claude Ryan told Mel that he once flew Amy Mollison from San Diego to Burbank in his prototype SCW to introduce her to Hughes. She was seeking sponsorship and a modern lightplane to add to her already impressive list of world records. She and Hughes spent the afternoon out in 18978.

. but apparently reached no agreement on sponsorship.

Eventually, the airplane was sold to an engineering firm on Long Island . . . from which it went to another in Connecticut . . . then to a third outfit in Rochester, New York. Here things get sketchy, but evidence exists to suggest the airplane was used in Alaska for a time — then brought back to New York.

During World War II, this airplane, Serial Number 6 and, according to a friend of Mel's who flew them as an instructor, **Numbers 10** and 11 were acquired by the Air Corps and were used at Love Field in Dallas to teach navigation to WASP pilots. This is the first "hard" evidence that two additional Harlows were indeed built, but Mel is still investigating to be certain the numbers were actually factory serial numbers rather than some sort of military designations. Microfilm records at Maxwell AFB may clear up the mystery when someone has the time to search them out.

Anyway, the airplane was returned to civilian status after the war . . . and given a new N number. It eventually ended up in the hands of an Illinois farmer, Bill Porter, and his sister. They owned it in the early 50s and flew it regularly, including a number of trips to Florida to escape northern winters. Then one day while showing some land to a couple of guys, Bill flew through a powerline, shearing off all but about a foot of the vertical tail. Incredibly, the Harlow remained under con-

trol as long as Bill kept it going straight, so he has able to belly it gently into a soy bean field. Damage at this point was minimal, but while the airplane was being trailered to a nearby airport, it was caught in a violent thunderstorm and pitched over on its back in a ditch, suffering extensive airframe damage.

Porter stored the wreckage on his farm and later sold it to a Harlow lover from Texas. From the time the airplane left Illinois until it turned up at Montgomery Field in the early 60s is pretty much a mystery to Mel. He's never really been able to find anyone who knows what happened to it during its stay in the Lone Star State . . . can any of you help?

So, there you have it - we have come full circle with Harlow 18978. In the 14 years he's had it flying, Mel and Dot have flown it all over the U.S. Especially since his retirement as a 747 captain in 1981, they rarely miss a West Coast fly-in and have been back to Oshkosh with it, also. A room full of trophies grows like mushrooms virtually every time the airplane is displayed, and still another one was added to the list at the Cactus Fly-In at Litchfield, AZ in February . . . where we cornered Mel in the back seat of the airplane and wouldn't let him out even to eat lunch until he had submitted to our interview. We show no mercy here at Sportsman Pilot when it comes to getting stories for our read-

Well, maybe we would have given him a bathroom break!





BRAD LARSON'S

RYAN SCW

The Best of Show award at this year's Cactus Fly-)In went to a familiar combination — Brad Larson and his Ryan SCW. Would you believe Brad has owned this airplane for 35 years . . . and that the SCW is still winning top awards at fly-ins on a restoration that was completed 30 years ago?

How's that for progressive maintenance! If you've attended any of the midwestern biggies over the past couple of decades — Rockford/Oshkosh or Ottumwa/Blakesburg — then no doubt you've been admiring Brad's highly polished SCW all the while. It was absolutely stunning in the 60s when I saw it for the first time and it looks just as good today. Ryan Aeronautical used a heavy gauge 24ST alclad to skin the SCWs and it seems capable of being polished forever.

I asked Brad about the circumstances of his purchase of the SCW back in 1948 and was told it was a purely incidental, almost accidental throw-in during the sale of another aircraft. At the time, Brad owned one of the former Shell Oil Howards and had a fellow hot to buy it from him. A lot of dickering back and forth was going on and it was beginning to look like an impasse was all that would result. Finally, Brad happened to notice a disassembled SCW in the back of the fellow's hangar and just on the spur of the moment, said, "Throw in all that stuff back there and you've got a deal."

"It's yours," was the quick reply . . . and that's how Brad came to own an airplane he's treasured for three and a half decades.

It's interesting to note that the price Brad and his buyer had become stuck on for the Howard was . . . eat your hearts out . . . \$2300! (But, remember, that was a lot of

dough in 1948.) From our viewpoint today, it's difficult to decide who got the best deal. We have to put things into some sort of historical perspective by realizing that both airplanes were only about 10 years old in 1948 and thus had none of the antique airplane aura that surrounds a Howard or a SCW today — any more than a couple of 1973 airplanes would have now. Also, we have to recall that all those DGA-15Ps built for the military during World War II had only recently been dumped on the civilian market at rock bottom prices, so scarcity was certainly not a factor in the price of Howards in those days.

All that really matters is that both men walked away from the deal happy with what they got . . . as they obviously did.

Brad stored the SCW in his basement and worked on it for five years before getting it flying again. At the start, Brad intended to simply get the SCW back in the air, but pretty soon he had the wiring out of it and was busy updating the electrical system . . . then he decided the upholstery needed replacing . . and after going to all that trouble and expense, naturally the thing had to have a decent engine, so out came the Warner for overhaul. You know the rest — a complete nose to tail restoration.

After getting the Ryan back in the air in 1953, it was used, among other things, as the trainer in which Brad's two sons learned to fly. He grins today when he recalls that at the time, they had no particular feeling for the SCW. It was simply their classroom — nothing special at all.

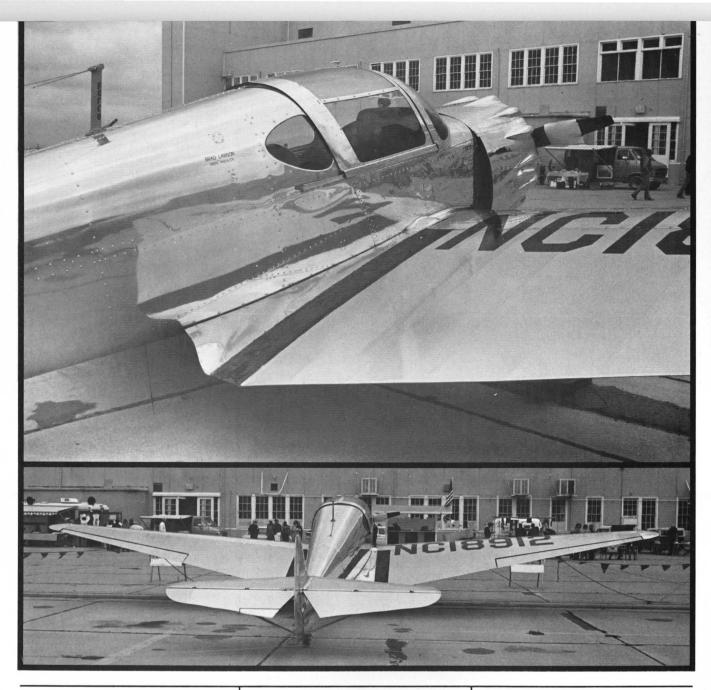
"Today," Brad says, "they both are on the airlines and think it's a pretty neat old

airplane."

Ryan SCWs were certified with 145 Warners but Brad's has been converted to a 165. Over the years, he has run Aeromatics and Curtiss Reed metal propellers, but currently is using a fixed pitch wood prop.

"The Warner is bolted solidly to the airframe," he explains, "and the wood prop is just a lot smoother than anything else. Otherwise, the airplane is pretty much the way it left the factory in 1938. It still has the perforated belly flap, or "drag brake" as it used to be known, and the old Johnson Bar brakes. This is a system, fairly common in the '30s, that first requires the pilot to pull on a hand lever, which, in turn, provides braking whenever a rudder pedal is depressed. The harder the lever is pulled, the more brake is applied. The system provides differential braking and when parked, doubles as a parking brake . . . and isn't nearly as tricky to use as it may sound.

The SCW, like the Harlow PJC-2 which you will read about elsewhere in this issue, was, for its time, a bold step forward in design and construction. Most American lightplanes of the mid-30s were tube and rag jobs and most were high wing or biplane configurations. A low wing, all metal airframe (with some fabric on the wings and control surfaces) with a long slender fuselage and almost radically tapered wings, the SCW was an exciting new shape in the skies of California in 1937. It had been designed to be built with the fewest individual parts and pieces as possible, which involved the building of a dimensionally accurate, full-scale plaster model. From this, casts were made that, in turn, were used to make the 200 or so sets



of dies to form the ring bulkheads, ribs, skins and fairings that, riveted together, made a gleaming new SCW.

There were a number of notable innovations - a "monocoque spar" (which engineers call a "D-section" today) that T. Claude Ryan was able to patent, some six degrees of wing washout to eliminate what otherwise might have been a vicious stall by the sharply tapered wing, and a perforated, belly mounted "dive brake" - actually a perforated split flap. This type of flap enjoyed a glorious hour upon aviation's stage in the late '30s and it's interesting to note that two of the most advanced lightplane designs of the period, the Ryan SCW and the Harlow PJC-2, both used them. Designers of the day did not have that much experience with low wing aircraft and were encountering problems with spin recovery, as required by CAA. Aircraft of the late '30s had to recover HANDS OFF from a six turn spin WITHIN THREE ADDI-TIONAL TURNS. If the airplane had flaps, it had to do it with the flaps down. Normal flaps tended to blank out the rudder in a full stall and the perforated type was seen as a solu-



tion, since it allowed air through the rows of holes even as it produced the desired drag for landing. After World War II, the problem "went away" when CAA eased up on spin recovery requirements . . . allowing designers to switch to flaps that produced added lift as well as drag to aid in slower (or shorter) take-offs and landings.

Having had the pleasure of flying the prototype Ryan SCW, NC17372, now owned by the EAA Aviation Foundation, I can tell you the perforated flaps are more than just effective - they are a virtual necessity. With its high lift wing and clean airframe - even including its closely faired fixed gear - the airplane is the pure dickens to slow down for landing without the flap. It's not difficult so much as it is unnerving . . . for without the flap, the SCW approaches at an uncomfortably nose high attitude. It's at a perfectly safe angle below stall, but when you are accustomed to the steeper approaches of modern airplane to float something awful. . . And while I'm digressing into personal

lightplanes, you keep wanting to lower the nose . . . which, of course, causes the

experience, I might as well tell you that the SCW is one of my all-time favorite airplanes. It is one of the most stable yet light and easy handling of the 112 or so different makes and models of airplanes it's been my good fortune to fly over the past 27 years since I soloed. You have excellent visibility (it's not bad even in the 3-point attitude) and its ground handling is easier than most taildraggers. There's nothing spectacular about its performance (with the possible exception of its flapless floating) — it's just so nice in so many ways.

Only 12 SC/SCWs were built by Ryan Aeronautical Company of San Diego before the production line was closed down to permit the work force to concentrate on more profitable orders for military trainers and aircraft parts subcontract work. Later, one additional SCW was assembled from parts by students of the Ryan School of Aeronautics. The SCW never would have been built in large numbers because it was a VERY expensive airplane.

In the late stages of the Great Depression its base price of \$6995 was a king's ransom. You could buy a new Chevy that year for around \$500 and get a fox tail for the radio antenna thrown in for free!

Brad's SCW, NC 18912, Serial Number 206, was the middle airplane of the production run - Serials 201 to 212. Its first owner was the Warner engine company, which made it a practice to buy an example of every airplane that used its engines and fly it for a year or so. L. A. Faunce, Warner's sales manager, ferried 18912 from San Diego to Warner's home base at the old Detroit, MI City Airport. This was in 1938. The next year the SCW was sold and went through an owner or two until World War II came along. During that terrible period, 18912 was made a bomber . . . and a movie star! Because of its vague resemblance to the Japanese Nakajima KI .27, five SCWs were leased to pose as enemy fighters in the filming of the movie Wake Island - and 18912 was one of them. It spent the rest of the war as a sub chaser for the CAP, fitted with bomb racks.

Brad says that when he began assembling the airplane, he discovered some bolt holes in the belly for which he couldn't figure out a use. Years later, someone sent him a picture of the airplane taken while it was in service with the CAP . . . with a bomb suspended beneath it. Mystery solved.

Six of the SCWs, in fact, were used during the war by the CAP for submarine patrol. One was credited with sinking a U-Boat, but I don't know which. Do any of you?

After the war, Brad's airplane somehow ended up in the back of the hangar of the buyer for his Howard — and he's owned it since. Over the 30 years he's had it flying, Brad's logged about 900 hours in the Ryan

or about 30 hours a year.

A native of Detroit, Brad learned to fly while still in high school, soloing in a Curtiss Junior. He signed on as a pilot for Northwest Airlines in 1942 and retired seven years ago. Throughout his career, he flew out of Minneapolis and continued to live there for three years after retirement. An avid antiquer, Brad has always taken advantage of layovers to snoop around local airports seeking out all the golden oldies. His favorite was Los Angeles because this allowed him to spend time at the fabled Santa Paula airport, an antiquer's paradise if there ever was one. He liked it so much, in fact, that four years ago he left the cold country and moved to Santa Paula — taking the SCW with him, of course. He subleases hangar space from Clayton Graves - the one with the "Substandard Airlines" sign over the door.

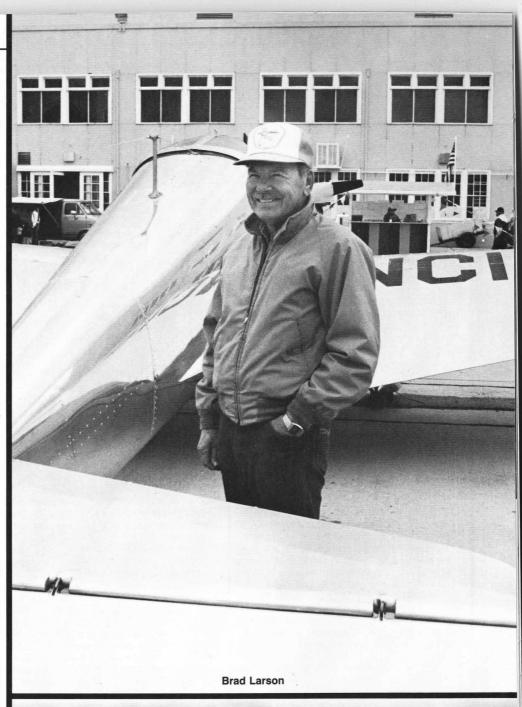
I asked Brad about the other lightplanes he has owned over the years.

"Oh, I've always had something," he replied. "I built up a Curtiss Junior two years ago, and sold it a little later. I'm currently building up two Cessna Airmasters and I've still got a Model A powered Funk back in Minneapolis I've got to pick up one of these days. And, let's see, I've owned a Bonanza along the way.

"I've had the Airmasters for 15 years. One is a '39 model and the other is a '40. Both are 165s, of course.'

I asked what he was going to do with so many airplanes - which got me a sly grin

"Oh, I don't know. I have to do something to keep busy."







For better or worse, Otto Timm will be remembered forever as the pilot who gave Charles Lindbergh his first airplane ride and dual instruction. What has long since been forgotten, except among us sportsman pilots and history buffs, is the fact that Timm went on to live a productive life as an airplane designer and manufacturer. In the late 20s he formed a company in Glendale, CA and built at least 5 examples of the open cockpit parasol you see pictured here, the Timm

Collegiate. Two of them have survived to be listed on FAA's records today, the first one, NC337, now owned by Boardman C. Reed of Brownsville, CA and the last one . . . the one pictured here . . . NC279V, owned by Keith E. Skeers of Glendale, Arizona. A perennial trophy winner at Phoenix area fly-ins, 279V has a couple of notable features other than its rarety and antiquity. Named the City of Los Angeles, it has a legend on the sides of the fuselage that reads: "Non-maintenance World's Endurance Record, Flying Night and Day 378 hrs. - 48 min., Nov. 1930". The "non-maintenance" reference is with regard to the fact that on many of the endurance record flights of the 20s and 30s, plugs were changed in flight and other maintenance was performed. Obviously, some credit would have to go to the Timm's engine . . . and that brings up the other interesting feature of 279V.

All five Collegiates were built with different engines: NC337 with a Kinner K-5; NC887E with a Comet 165; NC888E with a Curtiss Challenger 170; NC16E with a Continental 165 and NC279V with a MacClatchie Panther.

Yes, folks, a MacClatchie Panther!

Besides being your editor's all-time favorite name for an engine, the Panther was a pretty interesting hunk of machinery. As you can see in the pictures, it is a very compact little 7 cylinder radial with a front mounted exhaust

collector ring — dumping into a long stack that runs back up under the fuselage. Rated at 150 horsepower at 1900 rpm, the Panther had a bore of 4.5 in., a stroke of 5.5 in. and a total displacement of 612.15 cu. in. The compression ratio was by modern standards a laughably low 5.1 to 1. Fuel consumption was .56 lb. per hp/hr. and oil consumption was .023 lb. per hp/hr. Dry weight was 439 pounds; the diameter was 36 in. and the length 36.5 in.

The reason for the small diameter was the fact that the cylinders were of the L-head type. The valve train, induction and exhaust ports were on the front of the cylinders. The total height of the cylinders was short enough for the valves to be operated directly off the cam, and each had a plug above it that could be removed to permit grinding without having to remove a cylinder.

The cylinder barrels were machined from steel forgings (including fins) and each was attached to the case with 8 studs. The heads were aluminum alloy castings, screwed and shrunk into the barrels. Pistons were aluminum alloy permanent mold castings, with 4 rings. The crankshaft was made in 2 parts of nitralloy steel, and the master con rod had a solid big end.

The Panther's crankcase consisted of 4 aluminum alloy castings with the 2 center main sections joined in the plane of the cylinders.

Two Scintilla mags fired two plugs per cylinder and a Stromberg NAR-5A carb supplied the mixture. The engine had a drysump lubrication system, with a gear pump providing pressure lubrication to the bearings. A starter was optional.

The Panther, or Model X-2, was manufactured by the MacClatchie Manufacturing Company of Compton, CA. The CAA issued ATC #49 for the Panther on May 5, 1930 . . . and it expired on November 23, 1937.

If you wonder why Timm used so many

engines, a look through Joe Juptner's U.S. Civil Aircraft will show you this was a common practice in the late 20s and early 30s. Everyone, it seemed, was building airplanes and engines - all trying to cash in on the Lindbergh hysteria, of course. It was easy to certify an engine in those days, so the airframe companies took the easy way out and offered any and every engine that looked promising. Few of them, airframes or engines, survived the Great Depression simply because the market wasn't large enough for all to prosper. A lot of the "failures" were actually good designs and in more favorable times, might have succeeded . . . the MacClatchie Panther among them.

I asked the owner about parts for the Panther on 279V... and he just smiled. A lot of items had to be manufactured to get this one running, he indicated, and because of the expense and difficulty involved in doing so, we aren't likely to see the Collegiate too far from Phoenix.

Ah well, at least a Panther still prowls!





Ray BD-4

It's an accepted fact that building an airplane usually changes one's lifestyle. It's a lot of work spread out over a lengthy period of time and a lot of things can happen in the interim — some good and some not so good. Rarely, however, does it turn things in a new direction so abruptly and so completely as it did for Texan Ray Ward. It all began as he neared completion of his BD-4. One day he mentioned the fact to the operator of the private field where he based his Cherokee, and expressed his desire to make its initial test flight there.

"Oh, no, you can't fly experimental airplanes off this field!", was the rather indignant reply.

So, Ray had little choice but to start looking around for another airport near his home in Sugarland, Texas, just west of Houston. One day, quite by chance, he spotted an air park and after looking it over, became intrigued with the prospect of living on an airport. . . so much so that very shortly he began developing a piece of property he owned into his own airport/home site development. Ward Air Park, he called it. He built a 3100' grass

runway and erected a 4,000 square foot hangar . . . in which he completed the BD-4 and staged a gala hangar party to celebrate its maiden flight. Now he's in the process of building a new home there and is kept busy showing the place to prospective lot purchasers.

And, yes, experimentals are definitely welcome!

The BD-4 that started it all came into Ray's life as a project he hoped to share with his sons. The kit was purchased in 1972, but it lay untouched for a couple of years while his appliance sales and service business was being put on a sound footing. Even when he was able to get the airplane going together, it was a slow process, taking eight years of part time work to complete. The first flight at Ward Air Park took place in June of 1982. Two months later, he had it at Oshkosh . . . and had accumulated 100 hours of flying time by Sun 'N Fun '83 in mid-March.

Ray's BD-4 is a striking airplane — you just don't see that many highly polished examples of the design, and its red, white and baby blue accent stripe literally jumps

out of the mirror finish to grab your attention. You have to look fast, however, because it's a goin' piece of machinery. Powered by a 200 horse Lycoming IO-360 swinging a Hartzell constant speed propeller, it trues out at its most favorable altitude just short of 200 mph — 194 at 9500 feet, to be precise. It's just a shade faster, straight and level, than a friend's Mooney 201 . . . and outclimbs it by an almost embarrassing margin.

An interesting feature on this airplane, one which added about 7 mph and cut down significantly on cabin noise, is the set of slipstream deflectors mounted on each side of the windshield frame. As most of you will recall, Jim Bede was attempting to greatly simplify the construction of a high performance airplane when he designed the BD-4. The wing consists of a single large tubular spar with molded fiberglass "panel ribs" slipped over it and stacked like ice cream cones to form an airfoil. The fuselage is a flat-sided structure made by bolting together a stack of extruded aluminum angle. As Steve Wittman had been proving for decades with his Tailwind, Buttercup, Big X, etc., air



BD-4

molecules don't seem to mind the square corners at all — except, it turns out on the BD-4, at the sides of the windshield. If built to the plans, the -4's windshield is perfectly flat . . . and even though raked back at a rather acute angle, apparently "splatters" the slipstream quite smartly, as Ray puts it. At the sharp edges of the windshield frame the air detaches itself and does not smooth out along the fuselage sides again until almost halfway back toward the wing's trailing edge. In tuft testing conducted by Roger Mellema of Kent, Washington, the strands stood straight out in these critical areas — and the side windows drummed something awful.

Ray's fix for this condition was the attachment of two pieces of sheet aluminum, curved chordwise into a 6 inch radius, to the windshield frame . . . as you can see in the accompanying photography. Tuft testing by Ray shows that the air now curls around the "deflectors" and stays attached to the sides of the fuselage. As previously mentioned, the happy result is a 7 mph increase in cruise speed and a much quieter cabin.

Angular as it is, incidentally, the rest of the BD-4 fuselage, indeed the rest of the air-frame, is quite clean.

The BD-4 could be built with a tricycle gear or with the little wheel in the back — which was Ray's choice. For wheel fairings, he selected the big Bede speedpants, which at one point were fitted with doors that folded in flight to completely enclose the wheels. Ray's came out of those molds, but do not

have the doors - which were so prone to damage that they were eventually dropped by Bede Aircraft. (As an aside, your editor has the dubious distinction of having ridden through a "wheels up" landing in a speedpant equipped BD-4. In the early 70s Gene Soucy was Bede's test and demo pilot and took the prototype -4 on a nationwide tour. During his stop at Milwaukee, he took me for a ride including 8 point rolls! - and when we attempted to land, the wheel doors on the left pant wouldn't open. We flew to a nearby grass strip and Gene put it down like the pro he has always been. We simply slid to a smooth, uneventful stop. The doors had popped off but other than a little scratched paint, were otherwise no worse for the wear. Incidentally, I don't recall any really significant increase in speed when the gear doors were closed in flight. The airplane certainly looked nice with them tucked up, however.)

The BD-4 is a four-place airplane . . . to a degree. According to Ray, the back seat serves better as a nicely upholstered baggage compartment. He says you can get two people back there, but they have to be small or madly in love. There is a baggage area behind the seat in case two love birds are aboard

The airplane is set up for VFR flying, but has unusually good navigation capability due to the installation of a SRD Lab LORAN. Although still learning to use it and still working with his antenna, which is mounted inside the wing, Ray is full of praise for the LORAN.

It is extremely accurate, has a 99 waypoint capacity and costs less than a thousand dollars. The SRD unit is notable in that it is small enough to fit in the panel.

Ray sealed four of the fiberglass panel ribs in each wing so they could serve as fuel tanks. Total capacity is about 52 gallons. At 10 to 11 gallons per hour, endurance with a half hour reserve is about 4.5 hours. The airplane weighs 1260 pounds empty and climbs out at an initial rate of about 2000 fpm. The climb angle is quite steep. True airspeed is anywhere from 194 mph down, depending on altitude and how much fuel you want to run through the Lycoming. Ray has fitted a "ram" or alternate air selector valve in the induction air intake - similar to the Mooney system — that allows him to bypass the air filter and gain an inch of manifold pressure when it's needed.

Ray is very happy with his BD-4. He and his wife, Ann, enjoy taking it to fly-ins and it is fast transportation if he needs to use it in his business. It fills his needs to the extent that if he ever builds another homebuilt, he'd like it to be a purely recreational toy — something like a motorglider.

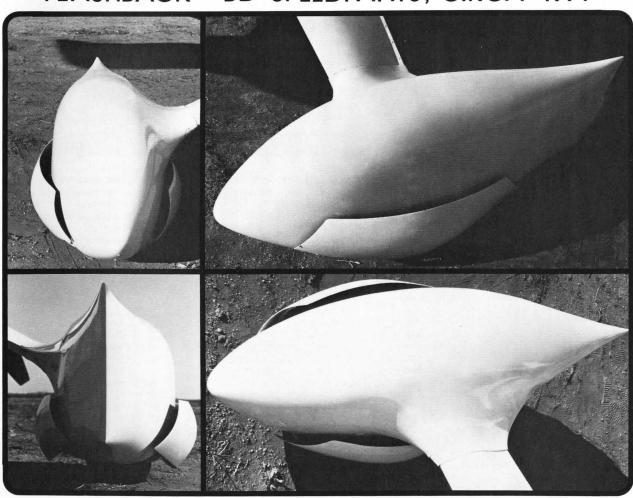
If you live in the area or are traveling through Houston, stop off at Ward Air Park and admire the BD-4 in person. Be prepared to get a sales pitch on a lot, though. They're an acre each, front on a county maintained, paved road and, of course, have a nice grass runway on the back.

And, again, experimentals are welcome.



BD-4

FLASHBACK - BD SPEEDPANTS, CIRCA 1971





With aviation turning its attention to the exotic world of carbon fiber, Kevlar and such, it might seem somewhat anachronistic to a newcomer to our ranks to learn that folks are still out there in their workshops gluing together wooden airplanes. It shouldn't, though, because as long as there are trees, there will be wooden airplanes.

For some, wood has an almost spiritual quality. It was, after all, once a living thing, sharing the water and air that sustains all life on our planet. Some just like the feel of it, the smell, the resiliency, its forgiving nature as a building material. Whatever, it will always have its adherents . . . and builders like Henry Elliott of Orlando, FL.

Henry showed up at Sun 'N Fun '83 with a brand new Emeraude, one of the most popular of all the airplanes designed to be crafted of wood. Eleven years in the making, it was a fine example of what can be done with the material and how easily it allows one to incorporate individualistic touches. Henry's Emeraude, for instance, is a "fastback" version, rather than the usual bubble canopy configuration.

The late Claude Piel designed the airframe to be powered by a small Continental in the 65 to 85 horsepower range, however, down through the years translators and modifiers

of his original French language/metric measurement plans have made it possible to utilize larger engines - mainly, the 108 to 160 hp Lycomings. Henry chose a 135 horsepower Lycoming 0-290-D2 that once labored under the cowl of a Piper Tri-Pacer - so. had to beef up his airframe to take the added hosses. He did so largely by substituting Douglas fir for the lighter spruce called out on the old plans. His spars and top and bottom longerons in the fuselage are fir. A nice little perk that came with this substitution was the fact that he was able to save a tidy sum by buying all his wood locally (except for the plywood). Most lumberyards stock Douglas fir, but aircraft quality spruce usually has to be shipped in from reputable houses like Wicks Aircraft or Aircraft Spruce and Specialty. If you can tolerate the weight of fir, it is obviously a good buy. Rescorcinal glue was used to build the spars - with Weldwood Plastic Resin used elsewhere.

The Lyc is fitted with an Aeromatic propeller, an efficient little device from the days of yore that you younger heads may not be all that familiar with. It's a propeller that automatically changes pitch, theoretically to the most efficient angle for the load being placed on it by the engine and the air it is pulling against. It does so by centrifugal force acting on a set

of offset, weighted arms mounted at the root of each blade. There are no controls back to the cockpit — the blades are free to turn within the limits of the mechanical stops built into the hub. At rest, you can grasp the blades and easily twist them from stop to stop.

What the Aeromatic does is to flatten out to provide maximum thrust for take-off and climb out, then automatically goes to a coarser pitch when you pull back the power for cruise. It's a simple thing, mechanically; it requires little maintenance — just checking the hub's oil level every 25 hours. Kept within normal wear tolerances and in balance, the Aeromatic is a smooth running, efficient propeller. It's even lighter than a fixed, metal prop for a given engine installation.

So why you may be asking yourself, isn't it in widespread use today? A Cessna 172, for instance, would be a far better performer in summer with an Aeromatic. Well, there were some problems back in its heyday. Pilots ran them too long between overhauls, didn't keep the oil level up, allowed the plastic coated wooden blades to sit out in the weather with no covers, ignored dents in the leading edge which affected balance and mixed blades of different weights when the factory manual plainly stated they had to be matched sets.

In other words, it wasn't an idiot proof propeller.

It did need to be in nearly perfect balance to work properly and it was altitude limited, but it did work. It was tough, too. Look at what Art Scholl has on the nose of his Chipmunk the next time you see it. There were two series of Aeromatics: the F-200 for up to about 200 hp and the F-220 for more powerful engines. And there was a version with a manual control to compensate for the thinner air of higher altitudes.

The Koppers Company of Baltimore manufactured the Aeromatic, utilizing patents held by the Everel Propeller Company. Installations were certified for about every U.S. lightplane manufactured from the end of World War II to about 1950. Today, the rights are owned by Univair and new blades can be bought from them.

Now, this lengthy digression has had a purpose — if you have the right attitude toward maintenance and operation, the Aeromatic is a highly desirable propeller for your sportplane . . . if you are a conscientious builder/pilot like Henry Elliott, for example. Otherwise, stick to a fixed metal prop.

The cowling on Henry's Emeraude is the result of a forum he attended at Oshkosh some years ago. In it, he picked up a formula for sizing cooling air inlets and outlets. His is sized to cool a 135 horsepower engine climbing out at 90 mph on a 90 degree day. The setup does include a cowl flap (which permits a tighter cowling), actuated from the cockpit with a T-handle — pull to open.

The cowling, itself, is of fiberglass, made by first stuffing Styrofoam around the engine and shaping it into a one-shot male mold. The various fairings on the airplane were made in the same fashion.

Inside the cockpit, Henry installed a full IFR panel with vacuum gyros. The transponder was installed as much out of a sense of self preservation as a desire to satisfy FAA regulations. Wood airplanes don't show up too well on radar, Henry figures. All the panel markings and labels were done with the kind of rub-off type obtainable in most drafting supply stores and were covered with a clear liquid plastic for protection.

The seats are lightweight steel tube frames, over which canvas was stretched and then upholstered. The upholstered side panels are foam backed and match the green of the wrinkle finish on the instrument panel. Some expanses of the wood structure inside the cockpit are left exposed — and finished like fine furniture

Outside, 6.00x6 wheels are used and are streamlined by Super Emeraude wheel pants from Rattray.

Finally, the entire airplane, including the plywood skinned areas, was covered in Stits fabric and finished with the Stits aircraft coatings. The attractive paint scheme is basically a cream or light yellow with green trim.

The Emeraude was completed last November and was test flown from the Sanford, FL airport which serves as its home base. Since the engine and prop were a certified combination, FAA was able to assign Henry a test flight period of just 25 hours (it likely would have been 40 with a non-certified engine and/or prop). This allowed him to make it to Sun 'N Fun '83, because the Emeraude had 31 hours on the tach when it touched down at Lakeland.

Henry has been pleasantly surprised with the performance of his homebuilt. At 21 inches and 2300 rpm it trues out at about 135 mph at lower altitudes. Over 8000 ft. at 19 inches and 2500 rpm, the true airspeed inches up to 150. Take-off roll is short — only 250 to 300 feet in all but the worst density altitude situations and the initial rate of climb is 1200 fpm at 100 mph. The airplane weighs 1038 pounds empty and it stalls at 42 mph indicated.

Fuel capacity (of the single tank mounted in the fuselage ahead of the instrument panel) is 27 gallons. Fuel consumption is averaging about 5.5 gph.

Henry Elliott is an electrical engineer employed by the Orlando utilities company. He was born in Miami in 1930, but went to public school in Illinois and graduated from the University of Minnesota — where he met his wife, Jean. After school, they moved to Florida and have been there — happily — since. Henry became interested in flying in 1962 when a friend took him for his first airplane ride. He was instantly hooked and soon both he and Jean had their Private tickets. Henry later added an instrument rating.

Jean, incidentally, was an active participant in the construction of the Emeraude. She sewed up the upholstery and, according to Henry, "spread a lot of glue and got her fingers sticky in the fiberglass lay up work."

When they make trips, they trade off legs in the left seat. Both enjoy flying the Emeraude very much. They hope to fly it to Oshkosh this summer — and on a lot of other long cross-country excursions as vacation time permits.

Wood suits them just fine.







BARREL CHESTED BIPE

The brawny, barrel chested biplane you see pictured here is a rather unusual variation of that American classic, the venerable Great Lakes. Powered by a 220 horsepower Continental W-670, it has had its fuselage faired out to match the size and contour of the Twin Beech cowl that houses the engine. It looks strong, and it is: climb is better than 1400 fpm and at full throttle, it will indicate 150 mph.

Not bad for a little ol' 52 year old sportplane originally powered by an 85 horsepower Cirrus Mk. 3.

Actually, this one is a homebuilt, a replica of a 1931 Great Lakes built in 1972 by Art Henderson of St. Paul, Minnesota. It was purchased a year and a half ago by Pan American Captain Bob Wilson of Ocala, Florida and has won the Best Replica award at the Sun'N Fun fly-in for two years running. It has a beautiful orange and white paint job and the workmanship is first class all the way.

Bob is an aerobatic/sport pilot when he isn't flying DC-10s for Pan Am and has always been an admirer of Great Lakes. During the course of the search that ultimately turned up this one, he had the opportunity to fly a 185 Warner powered version with four ailerons. It was one of the nicest **sport** airplanes he'd ever flown, he says, but he was not able to wrest it away from its equally appreciative owner. This one has the standard ailerons on the lower wings, so is a little less capable

in roll — even with the addition of spades. Bob still thinks it's a great little sportplane, nevertheless. It'll never be a Pitts or an Eagle, he sighs, but he's quite happy with it.

"Even without an inverted fuel system, I can do all the fun **inside** maneuvers. I can do 4 and 8 point rolls without the engine quitting. It will do one vertical roll, and it snaps surprisingly well — even double snaps. Cuban Eights and Immelmanns are lots of fun."

The airplane is currently fitted with a 96" Hamilton ground adjustable propeller, but Bob also has a Curtiss Reed for it. He's done a lot of experimentation with the Hamilton to determine the best pitch setting. He's found that at the optimum pitch, the Lakes will indicate 125 mph at 1850 rpm, 132 at 1900 rpm and as previously mentioned, 150 at full throttle — 2100 rpm. That's fast for an open cockpit, strut and wire braced biplane, but Bob has checked his indicated airspeed against that of other airplanes and has run measured distances against the clock, so he knows his speeds are quite accurate.

Needless to say, with the power and the big prop, the airplane gets off in a hurry — generally in a couple of hundred feet.

Although it was built 11 years ago, the Great Lakes has less than 150 hours of flying time recorded in its logs. It had been flown only 90 hours from '72 until '81 when Bob

bought it. He'd put 50 additional hours on it by the time Sun 'N Fun '83 had rolled around. He has added wheel pants, some fairings and a few aesthetic touches; otherwise, all the credit belongs to Art Henderson, Bob says.

Bob Wilson is a native of Cleveland, but has lived most of his adult life in Florida — 15 years in Miami and another 15 in Ocala, where he has an airstrip in his back yard. He's owned a number of lightplanes over the years, including an award winning Cessna 195 he built up from a basketcase.

At the moment, he's restoring another unusual old biplane — Wally Timm's air show Waco. It's a 1930 RNF, also powered with a 220 Continental and altered to mount a spring steel landing gear. It will be restored to the configuration it was in when Timm flew it in the old Cole Brothers Air Show . . with inverted fuel and oil, a smoke system, pressure carb and 4 ailerons, of course. The Waco's been completely disassembled, cleaned up, repaired as needed and is finally beginning to go back together. It still has a couple of years to go, however, Bob admits.

With his chesty ol' Great Lakes sitting out there in his back yard, ready to fly any time he has the notion, he'll be fortunate to complete the RNF in five years! Bob's only human, you know.



TC-2

One of the sensations of Sun 'N Fun '83 was a static display . . . but one of such appeal and promise that it drew larger crowds than most of the flyable showplanes. Called the TC-2, it's an all composite 2-seater designed by Val Bernhardt of Ft. Lauderdale, FL. It will be marketed by a company called AeroMirage, formed a year and a half ago by Val and his partner, Ken Fickett.

The pictures show what a sleek little thing the TC-2 is ... and it is little. The span is 21 feet, length is 16' 7" and the height is 5' 7". The one place it is big is in cabin width — 44". The fuselage is only 33" deep, however — an all-out effort to cut down on frontal area. You can see the resulting seating position in the pictures ... and the type of canopy used. Racey!

The design empty weight is 500 pounds and gross is 950, although Val confided that both numbers may be up a little by the time kits are available. At 950 pounds, the airplane is designed for 6 Gs — 9 ultimate — positive and negative.

The TC-2 is of all-molded construction —

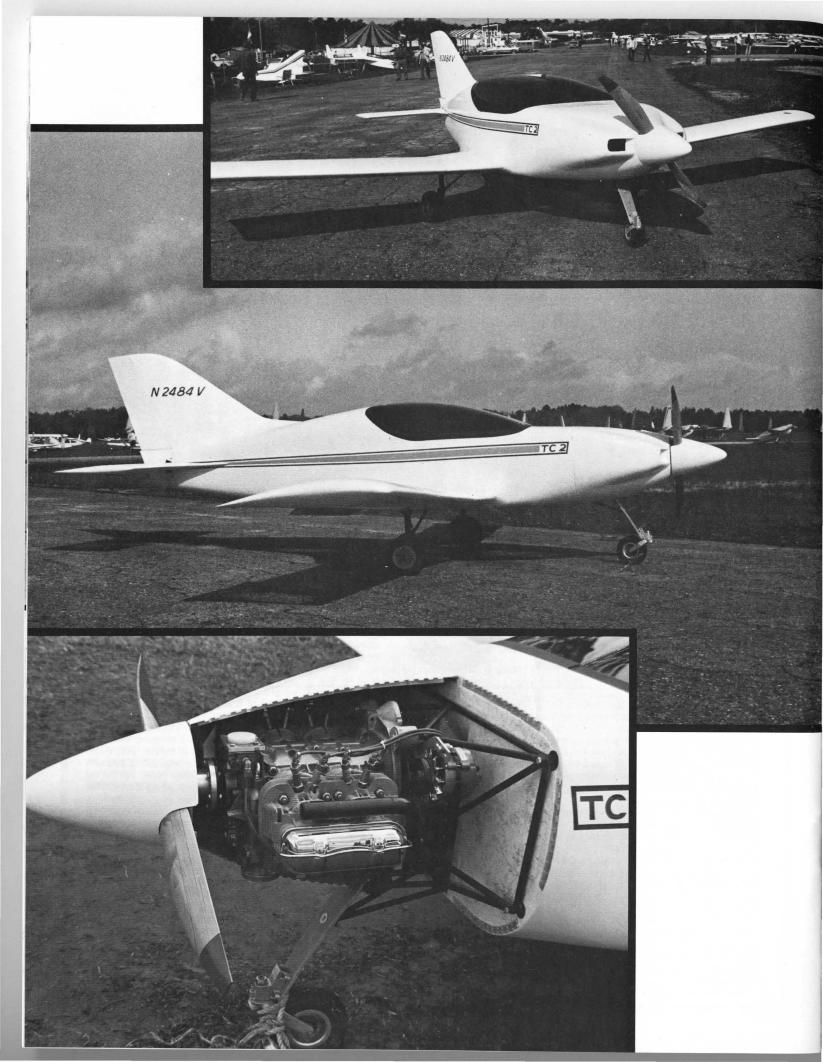
38 molded pieces to be exact. The fuselage material is a sandwich consisting of a ½" Klegecel core with 2 layers of Kevlar on the outside and one layer of S glass on the inside. The wings are similar, except that 2 layers of S glass are used for the outside skin instead of Kevlar. ½" cores are used in the main load bearing fuselage bulkheads. The resin used throughout is a vinylester. It has the epoxy molecular linkup, but is for most persons non-toxic. As with the Glasair, the airplane goes together much like a large plastic model. On the TC-2, however, the layups over the bonded joints are inside the airframe, so little outside finishing is required.

The prototype is fitted with a Type 4 Porsche/VW Transporter engine, converted for aircraft use by Gilbert Duty's Custom Aircraft Engines of Sanford, NC. As set up, it is expected to crank out about 85 horsepower. Projected performance figures include a cruise of 180 mph at sea level at 75" power. Stall with flaps is expected to occur at 57 mph — and at 63 mph clean. It will be possible to accommodate up to around 40

gallons of fuel in the wing — although this much would turn the airplane into a single seater. If one chose that loading configuration, however, he would be rewarded with a bladder busting range of nearly 1600 miles.

At Lakeland, the TC-2 was about a month away from its first flight, according to Val (which would occur, then, about the time this issue is being printed). A thorough test flight program will be conducted by a professional test pilot and when the airplane is flying to the satisfaction of all concerned, kits will go on sale. The price will be \$8050.00, minus engine, prop, instrumentation, paint and upholstery. All the molds are made, as is hard tooling for the metal parts - so AeroMirage will be ready to launch into full scale production when the "go" sign is given. If you want information on how things are progressing, the address is AeroMirage, 3009 NE 20th Way, Gainesville, FL 32601. Phone 904/377-4146. Info kit is \$5.00. A TC-2 Newsletter has already been started, so you may want to inquire about a subscription.





Sportsman Pilot

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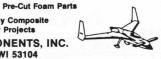
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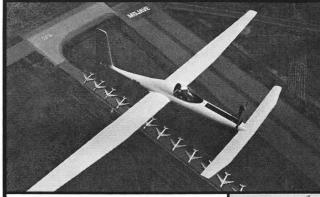
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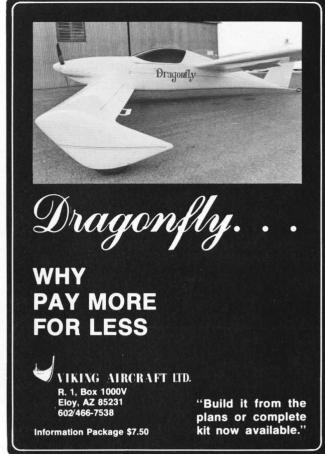
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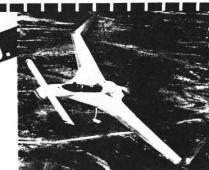
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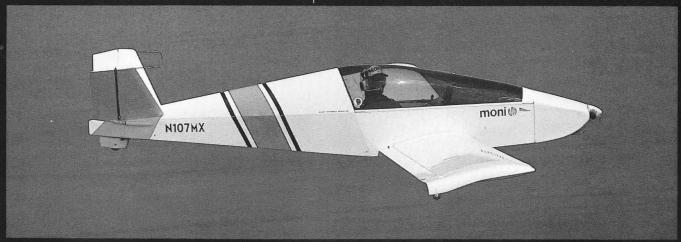
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